

REMARKS

Status of the Claims

Claims 1 – 5, 21, and 22 were previously pending.

Claims 6 - 20 had been withdrawn from consideration in response to the Examiner's Restriction notice.

Claims 1 and 5 have been amended.

Claims 1 – 5, 21, and 22 are now pending.

Support for these amendments can be found in the original specification of the application at least at page 7, lines 19 – 21, and page 7, line 29 – page 8, line 11. .

Examiner Interview of November 19, 2003

Applicants have received the Interview Summary of November 20, 2003, memorializing the interview of November 19, 2003. Applicants acknowledge that the Examiner has agreed that if claim 1 were amended to recite direct contact between the shaft and outer composite layer, then the claim would overcome the prior art to Puck. Applicants further acknowledge that the Examiner has agreed that if claim 1 were amended to recite the features as being inserted in the shaft, then the claim would overcome the prior art to Chulpsa.

Objection to the Drawings

The Examiner has objected to the drawings under 37 C.F.R. 1.83(a), specifically Figures 5 and 7, for not showing a composite shaft which could provide two points of contact. Applicants have amended Figure 5 to more clearly point out how the shaft could provide additional points of contact. Additionally, Applicants have added Figure 10, which is a viewpoint of Figure 7 from the side. Amendments have been made to the specification to describe Figure 10. Support for this amendment and new drawing can be found in the original specification at least at page 7, lines 3 – 28, and page 10, lines 1 – 11.

The Examiner has further objected to the drawings under 37 C.F.R. 1.83(a) for not illustrating all the limitations of claim 3. Applicants have amended claim 3 such that

all limitations of the claim are shown in the Figures. Therefore, Applicants request that the Examiner withdraw his objection to the drawings based upon 37 C.F.R. 1.83(a).

The Examiner has also objected to Figures 3A and 9A – 9D under 37 C.F.R. 1.84(p)(4) for using the same reference number to identify a part and modifications made to the part. Applicants have amended Figures 9A – 9D so as to show the different part modifications through reference numbers 16', 16'', 16''', and 16''''. Amendments have been made to the specification to describe these reference numbers. The full drawing sheets, including unamended figures and figures showing the changes in red, are provided for the Examiner's convenience. Therefore, Applicants request that the Examiner withdraw his objection to the drawings based upon 37 C.F.R. 1.84(p)(4).

Revised formal drawings will be submitted upon receiving a notice of allowance.

Objection to the Specification

The Examiner has objected to the Specification as failing to comply with 37 C.F.R. 1.71 for not providing proper antecedent basis for the limitation of a “fastener” shaped head piece, as recited in claim 3. The specification has been amended to add the term “fastener” to the specification. Therefore, Applicants request that the Examiner withdraw his objection to the specification.

Objection to Claim 5

The Examiner has objected to Claim 5 under MPEP §2173.05(h) for using the word “or” instead of “and” in the claim. Applicants have amended the claim to correct the problem and request that the Examiner withdraw his objection. Applicants state that this change has been made solely to correct the Markush group claim language, and is not an amendment to the scope of this claim.

Rejection of Claims 1 – 5, 21, and 22 under 35 U.S.C. §101

The Examiner has rejected Claims 1 – 5, 21, and 22 pursuant to 35 U.S.C. §101 as lacking utility in that the claimed invention is inoperative. The Examiner states that a

shaft body 34 as covered by a layer of composite fibrous material 36 cannot attain two point contact 32 with a metal sleeve 24.

Applicants traverse this rejection for several reasons. First, the claims are silent as to attaining two points of contact. Since the invention of claims 1 – 5, 21, and 22 are adequately described, the rejection is inappropriate.

Assuming for argument's sake that the claims do require two points of contact, Figures 5 and 10 show that, when the composite fibrous material layer is placed over and in direct contact with the entirety of the shaft body and the features, the composite layer follows the contour of the shaft. When one or more features are placed in the shaft before covering with the layer of composite fibrous material, the contours of these features can be seen in the final shaft. As such, when swaged, two points of contact are created – at the end of the drive shaft, and where the contour of the feature is mimicked in the contour of the composite material layer of the drive shaft. The claimed invention is operative as disclosed. Applicants request that the Examiner withdraw his objection of the claims under 35 U.S.C. §101.

Rejection of Claims 1 – 4 and 22 under 35 U.S.C. §102(b)

The Examiner has rejected Claims 1 – 4, and 22 pursuant to 35 U.S.C §102(b) as being anticipated by U.S. Patent No. 4,362,521 (“Puck”). Applicants have amended claim 1 and assert that Puck does not disclose the limitations of claim 1 as amended.

Claim 1 has been amended to include a “layer of composite fibrous material in direct contact with said shaft body, extending around and over the entirety of said shaft body and said features”. In contrast, Puck discloses that “[i]t is also important that the reinforced zones of the tube [the zones covered by outer sleeve 3] should not terminate abruptly ... the reinforcing sleeves 2, 3 are mechanically machined so that they taper conically towards the tube centre. This smooth continuous transition from the reinforced tube to the non-reinforced wall zone of the tube avoids any stress peaks.” (Puck, col. 3, ll. 26 – 34) (emphasis added). In other words, Puck discloses that the sleeve should be designed so as to transition from a drive shaft covered by a composite material to an uncovered shaft. Puck does not disclose a layer of composite fibrous material extending around and over the entirety of said shaft body, in direct contact with the shaft

body. Puck does not disclose or anticipate the composite fibrous material layer as claimed, and therefore does not disclose or anticipate amended claim 1. Claim 1 is therefore patentable over the Puck reference.

Claims 2 – 4 and 22 depend upon claim 1, and therefore are also patentable over the Puck reference for at least the reasons given above. Applicants request that the Examiner withdraw his rejection of claims 1 – 4 and 22.

Rejection of Claims 1 – 4, 21, and 22 under 35 U.S.C. §102(b)

The Examiner has rejected Claims 1 – 4, 21, and 22 pursuant to 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 4,704,918 (“Orkin”). Applicants have amended claim 1 and assert that, as amended, claim 1 is patentable over Orkin.

The pins of Orkin are designed for the primary function of acting as an anchor for the windings of composite fiber – “the braids of the strength member closely pass around and capture the pin protrusions to provide a strong bond between the strength member and the end fittings” (Orkin, col. 2, ll. 63 – 68). However, if these pins were to deform, the ability to provide that strong bond would be diminished, frustrating the purpose of the pin. As such, the Orkin pin must not be deformable.

In contrast, the features in the present application comprise “a plurality of deformable features inserted into said cylindrical shaft body”. This ability to deform is what creates extra friction at least in the embodiments of Figures 4A, 4B, 5, 7, and 10, leading to a more secure contact. Orkin does not disclose a deformable feature.

Additionally, Orkin does not disclose a “layer of composite fibrous material in direct contact with said shaft body, extending around and over the entirety of said shaft body and said features,” as claimed in amended claim 1. Orkin discloses two layers of material over the shaft body. The first layer, designated by reference number 32, is a braided composite layer. As previously mentioned, this layer is braided around, but not over the pins, as the pins act as anchors for this layer. (Orkin, col. 2, ll. 63 – 68). The second layer, designated by reference number 34, is applied over the pins. However, this layer is not a composite fibrous material layer – it is a pure resin layer. (Orkin, col. 4, ll. 3 – 13). Even though this resin binds into the composite material layer, there is no

composite material extending over the pins, only a coat of resin. Orkin does not disclose a composite fibrous material layer over the features.

Since Orkin does not disclose or anticipate a “layer of composite fibrous material in direct contact with said shaft body, extending around and over the entirety of said shaft body and said features”, it therefore does not disclose or anticipate amended claim 1. For at least the reasons above, amended claim 1 is therefore patentable over the Orkin reference. Further, since claims 2 – 4, 21, and 22 depend on claim 1, they are also patentable over the Orkin reference.

Rejection of Claims 1, 5, 21, and 22 under 35 U.S.C. §102(b)

The Examiner has rejected Claims 1, 5, 21, and 22 pursuant to 35 U.S.C §102(b) as being anticipated by U.S. Patent No. 5,080,943 (“Chulpsa”). Applicants have amended claim 1 and assert that Chulpsa does not disclose the limitations of claim 1 as amended.

Claim 1 has been amended to more clearly state that the features are inserted into the cylindrical shaft body. Chulpsa merely shows a layer of honeycomb material placed between two layers of composite material. Even if the honeycomb chambers were considered to be features, they are not inserted into the shaft body. For at least this reason, amended claim 1 is therefore patentable over the Chulpsa reference. Further, since claims 5, 21, and 22 depend on claim 1, they are also patentable over the Chulpsa reference.

Response to Arguments

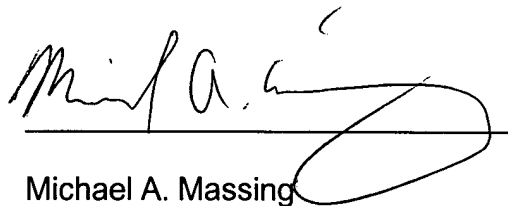
The Examiner has responded to Applicants’ statements, and found them unpersuasive. Applicants have amended claim 1 as earlier discussed, and assert that the present application is patentable over the Puck reference.

CONCLUSION

For the foregoing reasons, all of the rejections set forth by the Examiner have been overcome. Applicants therefore believe that the application is therefore in condition for allowance. Favorable reconsideration of the application is respectfully

requested. If for any reason, the Examiner is unable to allow the application but believes that an interview would be helpful to resolve any issues, he is respectfully requested to call the undersigned at (312) 245-5354.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Michael A. Massing", is written over a horizontal line. The signature is stylized with a large, sweeping loop at the end.

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